MONITORING PLAN
SOURCE CONTROL &DNAPL
RECOVERY SYSTEM

DETREX FACILITY
ASHTABULA, OH

Prepared for
Detrex Corporation
Ashtabula, OH

April 2005

URS

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Project No. 13810246

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Appendix A USEPA Correspondence

Acronym	*Description*
COC	Chemical of Concern
LNAPL	Light Non Aqueous Phase Liquid
MCL	Maximum Contaminant Level
MSL	Mean Sea Level
POC	Point of Compliance
SVOC	Semi-Volatile Organic Compound
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WWTP	Waste Water Treatment Plant

This Monitoring Plan has been prepared in response to the USEPA letter titled *Technical Support Issues Concerning the Addition of Experimental Extraction Wells and Site O&M, Detrex Source Control Area; Fields Brook Superfund Site* dated March 22, 2005. Specifically, this monitoring plan addresses USEPA comments on the December 12, 2004 updates to the monitoring section of the Operation and Monitoring (O&M) plan for the Detrex Facility.

1.1 BACKGROUND INFORMATION

Detrex Corporation (Detrex) operates a facility at 1100 North State Road in Ashtabula, Ohio. The general location of the Detrex Facility is provided in Figure 1-1. On February 26, 1998, the United States Environmental Protection Agency (U.S. EPA) issued a *Unilateral Administrative Order* (UAO) and a *Scope of Work for Remedial Design and Remedial Action for the Detrex Source Area* (the UAO SOW) requiring that Detrex develop plans and specifications for remedial measures at the facility.

The Phase I Remedial Investigation/Feasibility Study (RI/FS) Source Control environmental assessment investigations identified an area in the northeast corner of the Detrex Facility where soil and groundwater have been impacted by chlorinated volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). Soil borings and monitoring wells in this area have also identified a dense, non-aqueous phase liquid (DNAPL) layer that contains these VOCs and SVOCs. The area was formerly occupied by a series of settling ponds that were taken out of service and backfilled with soil. The former ponds were associated with manufacturing operations that have been discontinued at this facility.

Technical Memorandum 3 (W-C, May 1997) included a Feasibility Study that identified several conceptual remedial alternatives for the Detrex site. The U.S. EPA selected Alternative No. IV in the Source Control Record of Decision (ROD) issued September 1, 1997, to address the environmental conditions identified at the facility and prevent recontamination of sediment within Fields Brook. Alternative No. IV included:

- A downgradient vertical barrier wall (slurry wall);
- A groundwater collection trench upgradient of the slurry wall;
- A groundwater collection trench beneath the DS Tributary;
- Removal of sediments from the northern drainage ditch;
- Regrading activities in the northeastern portion of the property;
- Removal of the catalyst pile materials; and,
- Installation of a DNAPL recovery system.

Each of the action items, with the exception of the DNAPL recovery system, was addressed in the *Plans and Specifications for Remedial Design/Remedial Action* dated February 17, 2000. A *Remedial Action Work Plan* for those activities was issued on August 28, 2000 and work was initiated in September 2000. The slurry wall, collection trenches, sediment excavation, site grading and catalyst pile removal were completed in March 2001.

The *Plans and Specifications for DNAPL Recovery System* was issued at the 100 percent level on April 13, 2001. As agreed with USEPA, 12 of the 36 proposed recovery wells were installed in order to evaluate the DNAPL recovery system design as a pilot study prior to full-scale implementation. Construction of the pilot DNAPL recovery system was completed in October 2002. A layout of the site and existing features are presented on the Site Features Map on Figure 1-2.

A Supplemental Pilot Study Work Plan was prepared in response to an October 12, 2004 Comment Letter from USEPA concerning operation and maintenance (O&M) issues encountered during operation of the DNAPL pilot recovery system installed at the Detrex Facility. Detrex has proposed the installation of two "experimental" wells to evaluate potential alternative designs in response to the operation and maintenance issues that had been identified with the DNAPL recovery system. It is anticipated that the experimental wells will be installed during summer 2005.

The supplemental Pilot Study Work Plan addressed USEPA Comment 1 through Comment 7 of the October 12, 2004 USEPA comment letter. USEPA Comment 8, which specifically addressed the monitoring plan for the Detrex Facility, was addressed in a separate submittal provided to USEPA by Detrex on December 12, 2004. Additional comments on the monitoring plan were provided by USEPA to Detrex on March 22, 2005. This plan has been prepared in response to the March 22, 2005 comments.

A copy of the USEPA correspondence, including the March 22, 2005 comment letter, the October 12, 2004 comment letter, as well as the November 12, 2004 Detrex response to USEPA concerns and the December 12, 2004 submittal is provided in is provided in Appendix A of this monitoring plan.

1.2 SITE GEOLOGY AND HYDROGEOLOGY

Soil types within the southern half of the Detrex Plant property belong to the Conneaut Soil Series, according to the "Soil Survey of Ashtabula County" published by the Ohio Department of Natural Resources in May 1973. The Conneaut soils occur on nearly level land and are poorly drained. Due to their poor drainage and slow permeability, these soils exhibit seasonal wetness for long periods of time. The portion of the property in and around the manufacturing plant is described as "made land" due to the disturbance of the soils. This area contains a considerable amount of earth fill with the original soils being greatly altered or disturbed for construction of buildings, tanks, roadways, etc.

The topography of the site is relatively flat except for the southern boundary near Fields Brook. Surface water in the northwestern portion of the property drains north to northwest.

The geology of the site consists of 4 to 6 ft. of mottled silty clay with trace sand and 4 to 7 ft of a unit described as silt-sand-clay mixture; interbedded silt, sand and clay; a loamy silty clay with trace sand; or laminated silt and clay with trace sand. Beneath the second unit is 20 to 25 ft of gray, hard, often dry silty clay (Ashtabula Clay) with trace sand and gravel and shale fragments. Shale bedrock occurs approximately 40 ft below the ground surface (bgs). Laboratory testing of the subsurface materials indicates a very low permeability due to the high percentage of clay and

silt size particles. The silty clay and clayey silt deposits were found to have a coefficient of permeability ranging from 2 x 10^{-6} cm/sec to 9 x 10^{-8} cm/sec.

The top of the Ashtabula Till Clay is generally encountered at approximately 15 to 25 feet below ground surface across the site. A topographical high was observed in the Ashtabula Clay along the southern border of the Detrex property. Areas north of the topographical high slope generally to the north to northwest towards state road and areas south of the topographic high slope to the south towards Fields Brook. A north-south geologic cross-section developed during the Fields Brook Phase I SCRI is presented on Figure 1-3.

The groundwater flow direction in the shallow water bearing zone shows a similar flow pattern across the site. The area along the southern border of the site migrates south towards Fields Brook. Groundwater across the remainder the site flows north to north/northwest toward the DS tributary bordering the site to the north. A groundwater contour map formerly presented in the URS' Remedial Design Workplan, dated January 8, 1999 is presented on Figure 1-4.

1.2.1 Development of Monitoring Well Network

A monitoring well network was developed to allow Detrex to assess the effectiveness of the remedial systems currently operating on the Site. The remedial systems consist of a slurry wall along the northwest corner of the property: a groundwater collection system located along the upgradient (east side) of the slurry wall; and a pilot DNAPL vacuum enhanced recovery system located along the north center property border. A general layout of the remedial systems is presented on the Site Features Map (Figure 1-2).

1.2.1.1 Dissolved plume

As previously discussed, groundwater across the site generally flows towards the northwest. A topographic high in the groundwater flow direction occurs along the southern border of the property. The dissolved plume is expected to flow in the same direction as the groundwater flow direction. The slurry wall, groundwater recovery trench, and the DS interceptor trench were designed to prevent dissolved phase contaminants and DNAPL from migrating offsite and discharging to the DS tributary. Which is located on the northwest corner of the Site.

The monitoring well network should provide background data and data necessary to show that the dissolved plume is not migrating from the site. The network should contain monitoring wells upgradient and downgradient of the plume.

Upgradient

Due to the topographic high area in the groundwater flow direction, few monitoring wells are in a true upgradient direction. Monitoring wells DET02S, DET11S, DET17S, and DET18S are located upgradient and side gradient of the DNAPL and dissolved phase plume. Monitoring well DET17S is located on the southern side of the groundwater divide. Groundwater data from DET17S will provide background concentrations and show whether dissolved phase contaminants or DNAPL are migrating to the south from the DNAPL source area across the divide. DET18S provides control in the eastern upgradient direction. DET02S and DET11S provide side gradient control in the western direction.

Downgradient

Monitoring points are necessary down gradient of the DNAPL plume to assess migration of the dissolved phase plume. Additionally, the downgradient monitoring points are utilized to assess the potential migration of DNAPL from the main source area. Monitoring wells located down gradient of the DNAPL plume include DET-04S, DET-20S, DET-21, RMI 1-S and RMI 2-S. Monitoring wells DET01S and RMSMW05S appear to have been destroyed.

Monitoring Well DET04S is located immediately downgradient of the DNAPL plume within the dissolved plume. It will be utilized to assess the dissolved plume concentrations immediately upgradient of the slurry wall and groundwater collection trench. DET-21 is located on the downgradient side of the slurry wall and will be utilized to assess potential breakthrough of dissolved contaminants or DNAPL.

1.2.1.2 DNAPL

The DNAPL pilot recovery system was designed to reduce the quantity of DNAPL and to prevent the migration of DNAPL from the Site.

Due to the presence of DNAPL at the site, density flow, as well as, advective flow must also be considered in the design of the monitoring well network. The maximum areal extent of DNAPL is shown on Figure 1-2. The DNAPL flow direction is expected to follow (via density flow) the slope direction of the top of the Ashtabula Clay Till. The Ashtabula Clay Till shows a topographic high area along the southern portion of the property. The slope is generally to the north/northeast and south of this high area. Monitoring well DET-10S is located just north of the topographic high area. All wells showing measurable levels of DNAPL are located north of the topographic divide.

The DNAPL thickness and migration will be evaluated by measuring DNAPL in monitoring within the plume and immediately downgradient of the plume and upgradient of the plume. Additionally, monitoring wells located upgradient and side gradient will also be measured for the presence of DNAPL during the semi-annual sampling events. If monitoring wells become damaged or inaccessible due to unforeseen conditions, Detrex will notify the USEPA.

- Monitoring wells within the DNAPL plume include:
    - DET05S,
    - DET06S
    - DET07S,
    - DET08S
    - DET09S, and
    - DET010S.

- Monitoring wells located immediately downgradient of the DNAPL plume include:
  - DETMW-04S
  - DETMW-20S,
  - RMI-1S,
  - RMI-2S,
- Monitoring wells located immediately upgradient of the DNAPL plume include:
  - DETMW-17S
  - DETMW-18S
  - DETMW-11S
  - DETMW-02S

1.3 ORGANIZATION

This report is organized into 5 sections. Section 1.0 is the introduction. Section 2.0 provides the objectives and approach for the PBGM plan. Section 3.0 presents the field procedures for sample collection. Section 4.0 describes the groundwater monitoring reporting requirements. Section 5.0 lists the references utilized in the production of this document.

2.1 OBJECTIVES

The objective of the recovery system and groundwater monitoring at the Detrex Facility is to assess the effectiveness of the DNAPL recovery system, as well as the slurry wall, groundwater recovery trench, and the DS Tributary Interceptor Trench. Groundwater monitoring data will also be utilized to demonstrate that the DNAPL plume is stable or reducing in aerial extent. The results of the monitoring program will be utilized to demonstrate that the site groundwater and DNAPL plume are not potential sources of contamination to Fields Brook or its tributaries.

Monitoring activities include collection of groundwater samples, measurement of the thickness of the DNAPL within the area of the plume, inspection of the stormwater collection sump, inspections of the DNAPL recovery system, and vapor emissions sampling.

2.2 RECOVERY SYSTEM MONITORING

2.2.1 Inspections

The DNAPL system will be operated during working hours. Flow totalizer and DNAPL volumes will be estimated and recorded daily and documented by Detrex personnel. System maintenance personnel will prepare maintenance and inspection reports for the DNAPL Recovery System. These reports will be archived in the project file and stored at the Detrex central file location for no less than three years.

2.2.2 Vapor Emissions Sampling

Vapor emissions are continuously monitored via an in line indicator. All vapors are exhausted through at least two carbon canisters that are installed in series. When the first in line indicator fails, a new container is installed as the second container in the series and the previous second container becomes the first container. This process is repeated every time the in line indicator turns color showing the activated carbon is spent.

2.2.3 DNAPL Thickness Monitoring

Groundwater elevations and DNAPL thickness will be measured from monitoring wells located within the estimated aerial extent of the DNAPL plume and immediately down gradient of the plume on a quarterly basis. Additionally, monitoring wells located outside DNAPL plume will be inspected for the presence of DNAPL during scheduled groundwater sampling events. Wells to be monitored include:

- DETMW-02S,
- DETMW-04S,
- DETMW-05S,
- DETMW-06S,

- DETMW-07S,
- DETMW-08S,
- DETMW-09S,
- DETMW-10S,
- DETMW-17S,
- DETMW-18S,
- DETMW-20S,
- DETMW-21,
- RMI-1S, and
- RMI-2S.

In order to prevent cross contamination, DNAPL thickness monitoring will be completed utilizing dedicated equipment within the established perimeter of the DNAPL plume. The dedicated equipment will not be used to measure water levels outside this area. Visual measurements will be made utilizing a disposable one time use bailer.

2.3 SLURRY WALL, GROUNDWATER RECOVERY & DS INTERCEPTOR TRENCHS

2.3.1 Inspections

The stormwater collection sump will be inspected quarterly for flow. Additionally, the cleanouts will be inspected quarterly for physical damage. System maintenance personnel will prepare maintenance and inspection reports for the stormwater collection sump inspection. These reports will be archived in the project file and stored at the Detrex central file location for no less than three years.

2.4 GROUNDWATER MONITORING

Groundwater samples will be collected to assess the extent of the dissolved phase plume, as well as the performance of the slurry wall, the groundwater recovery trench, and the DS Tributary interceptor trench. Groundwater levels and DNAPL thickness will be measured on a quarterly basis. In order to prevent cross contamination, groundwater levels will be measured utilizing dedicated equipment. Equipment used to measure DNAPL thickness within the plume area will not be used to measure water levels outside the DNAPL plume area. Groundwater samples will be collected on a semi-annual basis.

2.4.1 Analytical Methods

Samples will be analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) via Methods SW846-8260 and SW846-8270, respectively. Samples will be analyzed by Firstech of Cleveland, OH.

2.4.2 Monitoring Well Network

In order to assess the presence and concentrations of the COCs in groundwater, seven monitoring wells will be sampled during each quarterly groundwater monitoring event. The locations of the monitoring wells are presented in Figure 1-2. Groundwater samples will be collected from selected monitoring wells located both upgradient and downgradient of the slurry wall, as well as along the western and southern edges of the DNAPL plume.

The following wells will be included in the monitoring well network for monitoring the performance of the slurry wall, groundwater recovery trench, and the DS interceptor trench, and the DNAPL recovery system:

Upgradient

- DETMW-11S
- DETMW-17S
- DETMW02S
- DETMW-18S

Downgradient

- DETMW-21 (down gradient of slurry wall)
- DETMW-20 (eastern extent of DS interceptor trench)
- DET-04S (within dissolved plume)

2.4.3 Data Validation

Upon completion of each sampling event, a standard data quality review will be completed to ensure that the data is useable for the purpose for which it was intended. A standard data quality review includes assessment of supporting quality control (QC) elements such as laboratory blanks, laboratory control samples, surrogates, sample duplicates, and matrix spikes, as well as holding times, detection limits, dilution factors, and information provided in the report narrative. A standard review does not include evaluation of instrument performance and calibrations or reconstruction of the analytical data.

2.5 GROUNDWATER & RECOVERY SYSTEM DATA EVALUATION

In order to demonstrate that the slurry wall, collection trenches and the DNAPL removal system are effective in preventing site groundwater and DNAPL from impacting Fields Brook or its tributaries, analytical data will be reviewed after each event to ensure that there are no uncontrolled releases from the site, i.e. none of the COCs have demonstrated significant increases in concentration over historical data. As part of this review, product thickness and groundwater flow direction will be assessed and evaluated to ensure that the data supports the functionality of the system, i.e. groundwater flow direction is consistent with historical records and that DNAPL thickness in the vicinity of the recovery system is stable or decreasing.

After five years of groundwater sampling, a review will be made of the analytical results and the sampling program may be modified if results indicate that concentrations are stable or

decreasing. An appropriate statistical method such as the Mann-Kendall trends test will be utilized to determine whether the data is demonstrating stable or decreasing concentrations of COCs when compared to historical data. Since the distribution of the data is not currently known, the selection of an appropriate statistical method will not be made until all the data has been collected.

Additionally, trends in DNAPL recovery and DNAPL system recovery operational trends will be evaluated to assess the effectiveness and continued operation of the DNAPL recovery system.

3.1 GROUNDWATER MONITORING

All groundwater samples will be collected using disposable, high-density polyethylene bailers. This technique involves sampling groundwater by purging the well by lowering the bailer into the water column and removing groundwater from the well until the water quality have stabilized.

The following information will be recorded in the field log book at each groundwater sampling location:

- Date and time,
- Barometric conditions, temperature, and general weather conditions,
- Depth to water measured from the surveyed top of the well casing,
- Depth to the top of DNAPL (if any), and
- Depth to bottom of well measured from the surveyed top of the well casing.

A standard electronic water level indicator will be used to take the measurements for locations located outside of the DNAPL plume area. Additionally, the wells will be measured in order from least impacted to most impacted. This determination shall be made based on the most current groundwater analytical results. The water level indicator will be decontaminated between each well as specified in Section 3.2.

DNAPL measurements will be collected utilizing a dedicated interface probe, which is capable of measuring the top of the water column, as well as, the top of the DNAPL layer (if present). Due to the difficulty in adequately decontaminating the interface probe, it will only be used in monitoring wells that routinely contain DNAPL. Monitoring wells located outside the DNAPL plume area will be assessed for the presence of DNAPL by lowering a bailer to the bottom of the well during each quarterly sampling event. Visual observations will be recorded in the field log book.

On the basis of the above measurements and well diameter, the volume of water standing in each well will be calculated. Well purging will be conducted by lowering the dedicated one-time use HDPE bailer into the well. Prior to initiating the well purging and after each well volume, the discharge water will be measured for specific conductance, pH and temperature. All purge water will be containerized and disposed of through the Detrex water treatment system in accordance with federal, state and local regulations.

Sampling will commence after at least three well volumes have been purged or parameters (temperature, pH, and specific conductance) have stabilized (defined as 10 percent or less parameter fluctuation between two successive measurements). If the well is purged to dryness or is purged such that the full recovery period exceeds 2 hours, the well will be sampled as soon as sufficient volume of groundwater has accumulated in the well to allow the collection of the necessary groundwater samples.

Sampling will be performed using the same equipment as that used for purging. All field measurements will be documented in the field logbook.

- At each location, groundwater samples will be collected for VOCs and SVOCs, as required,
- After the groundwater parameters have stabilized or after a minimum of three well volumes have been purged from the well, samples will be directly poured into laboratory supplied glassware.
- Samples will be immediately placed in an iced cooler and maintained at a temperature of 4 degrees Celsius or lower, without freezing until they are delivered to Firstech Laboratories of Cleveland, Ohio under standard chain-of-custody protocol.

With the exception of the detergent that will be used for the initial cleaning, the solutions used to decontaminate the field equipment will not be re-used. All spent solutions will be containerized and disposed of through the Detrex water treatment system in accordance with federal, state and local regulations. Disposable equipment will be contained in a plastic garbage bag for disposal as solid waste.

3.2 DECONTAMINATION PROCEDURES

All sampling equipment to be utilized will be one time use and will be disposed of following use at each well. The water level indicator and the interface probe require decontamination prior to use at each location. The entire length of cable that comes into contact with groundwater or DNAPL will be decontaminated in the following manner:

- The equipment will be rinsed with clean potable water,
- Followed by an Alconox/water solution rinse;
- Followed by a deionized water rinse.

If DNAPL is encountered the equipment will be rinsed with Methanol following the Alconox/ water solution rinse.

3.3 SAMPLE IDENTIFICATION

All analytical samples will be assigned a unique sample identifier. The identifier will be comprised of the following information:

- Sample Location (monitoring well identification number, (i.e., DETMW-04S),
- Sample date , and
- Sample type (Environmental, Replicate, or Trip Blank).

3.4 SAMPLE HANDLING AND PACKING

Samples will be collected in order and containerized according to the volatility of the target analytes. The collection order for the analytes is as follows (where applicable):

- Volatile organics (VOAs or VOCs)
- Semivolatile organics (SVOCs)

Immediately following collection, samples will be placed in iced, insulated coolers. Samples will be packed in bubble wrap or equivalent material, placed in iced, insulated coolers and shipped to the approved laboratory via overnight courier. Proper chain of custody will be maintained during sample handling and shipping activities.

3.5 QUALITY ASSURANCE/QUALITY CONTROL

QC samples will be collected at the following frequencies:

- Field Duplicates (D) – One (1) per 10 environmental samples collected or a minimum of one per sampling event,
- Field Blank Samples (B) – One (1) per 20 environmental samples collected,
- Trip Blank Samples (TB) – One (1) trip blank will be included in each cooler containing aqueous samples for VOC analysis,
- Organic Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples – One (1) per 20 environmental samples collected, and
- Inorganic Matrix Spike/Laboratory Duplicate (MS/LD) Samples – One (1) per 20 environmental samples collected.

3.6 EQUIPMENT CALIBRATION

Instruments used to gather, generate, or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the manufacturer's specifications. Field measurement instruments will include one or more of the following: multi-parameter meter, pH meter, specific conductance meter, thermometer (or temperature probe), and electronic water-level indicator. As a rule, each field measurement instrument will be calibrated daily prior to use and the calibration checked every 15 samples.

Calibration procedures will be documented in the field records. Documentation will include the date and time of calibration, the identity of the person performing the calibration, the reference standard used, the readings taken, and any corrective action.

3.7 SAMPLE CONTAINER, PRESERVATION AND HOLDING TIME REQUIREMENTS

The following table presents the sample container, preservation and holding time requirements:

Analysis Method	Sample Container	Preservative	Holding Time
SW846-8260B (VOCs)	Three 40-ml glass vials with teflon-lined caps	No headspace HCL to pH<2 Ice (4°C)	14 days from time of collection
SW846-8270C (SVOCs)	Two 1-liter amber glass bottles with teflon-lined caps	Ice (4°C)	7 days from time of collection

4.1 QUARTERLY STATUS REPORTS

Quarterly status reports will be prepared and submitted to USEPA. The quarterly reports will summarize the following:

- DNAPL thickness monitoring,
- Groundwater levels,
- DNAPL volume recovered,
- Groundwater monitoring results,
- Data review results, and
- Schedule.

Detrex will retain these records for no less than three years.

4.2 GROUNDWATER SAMPLING REPORTING

The results of the groundwater monitoring will be summarized in the quarterly status report following the receipt and review of the data. The groundwater monitoring summary will include the following items, as appropriate:

- Figure presenting locations of monitoring wells
- Sampling dates
- Summary of groundwater level and DNAPL thickness readings from two proceeding quarterly events
- Groundwater contour map
- Summary of analytical results
- Results of statistical analysis, if completed

The summary report will be submitted to USEPA within 45 days of receipt of laboratory data. Detrex will retain these records for no less than three years.

Woodward-Clyde, 1994, Fields Brook Phase I SCRI, Figure 4.3.7.

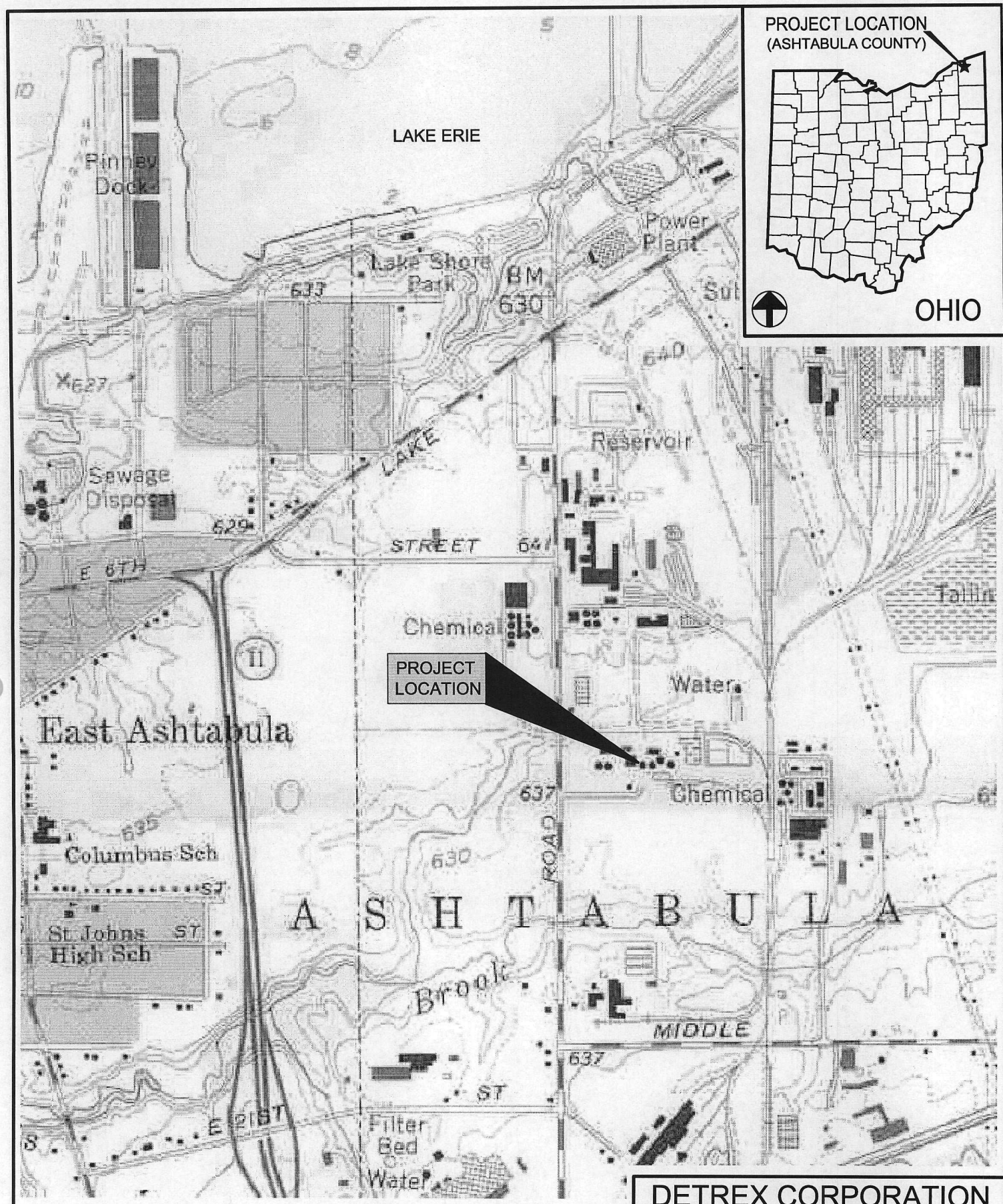
Woodward-Clyde, November, 1995, Phase I Source Control Remedial Investigation Report.

Woodward-Clyde, December 1995, Comment Response Report Detrex Facility, Ashtabula, Ohio.

Woodward-Clyde, January 8, 1998, Remedial Design Workplan, Detrex Corporation, Ashtabula, Ohio.

URS Greiner Woodward-Clyde, January 11, 2000, Final Design North Sewer Source Area, Fields Brook Superfund Site, Ashtabula Site, Ashtabula, Ohio.

Figures



UNITED STATES GEOLOGICAL SURVEY
1:24,000 QUADRANGLE
ASHTABULA NORTH, OHIO
1960 PHOTOREVISED 1970
PHOTOINSPECTED 1978

DETREX CORPORATION

Figure 1-1
General Location Map

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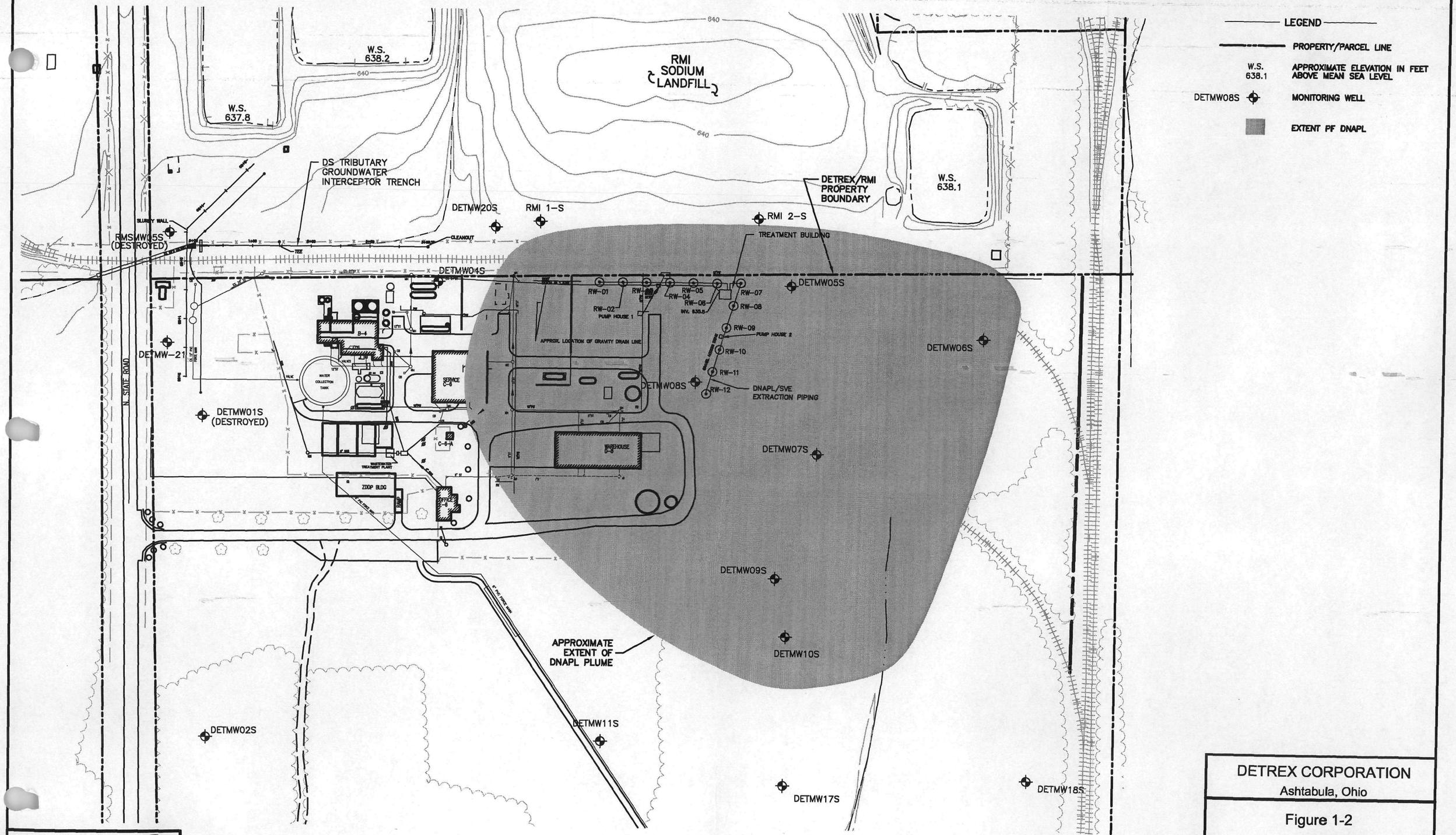

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DETREX CORPORATION
Ashtabula, Ohio

Figure 1-2
Site Features Map

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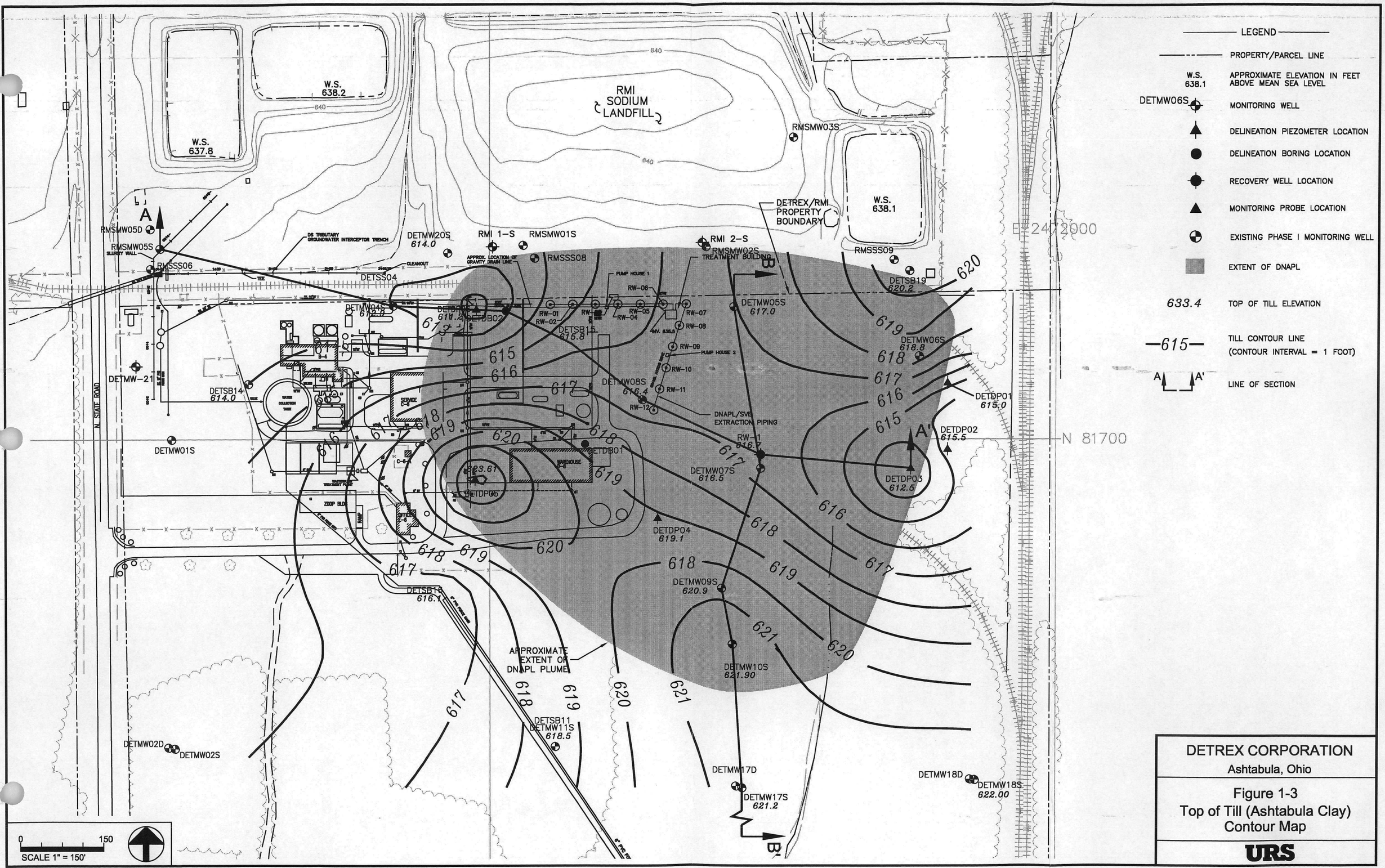

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DETREX CORPORATION
Ashtabula, Ohio

Figure 1-3
Top of Till (Ashtabula Clay)
Contour Map

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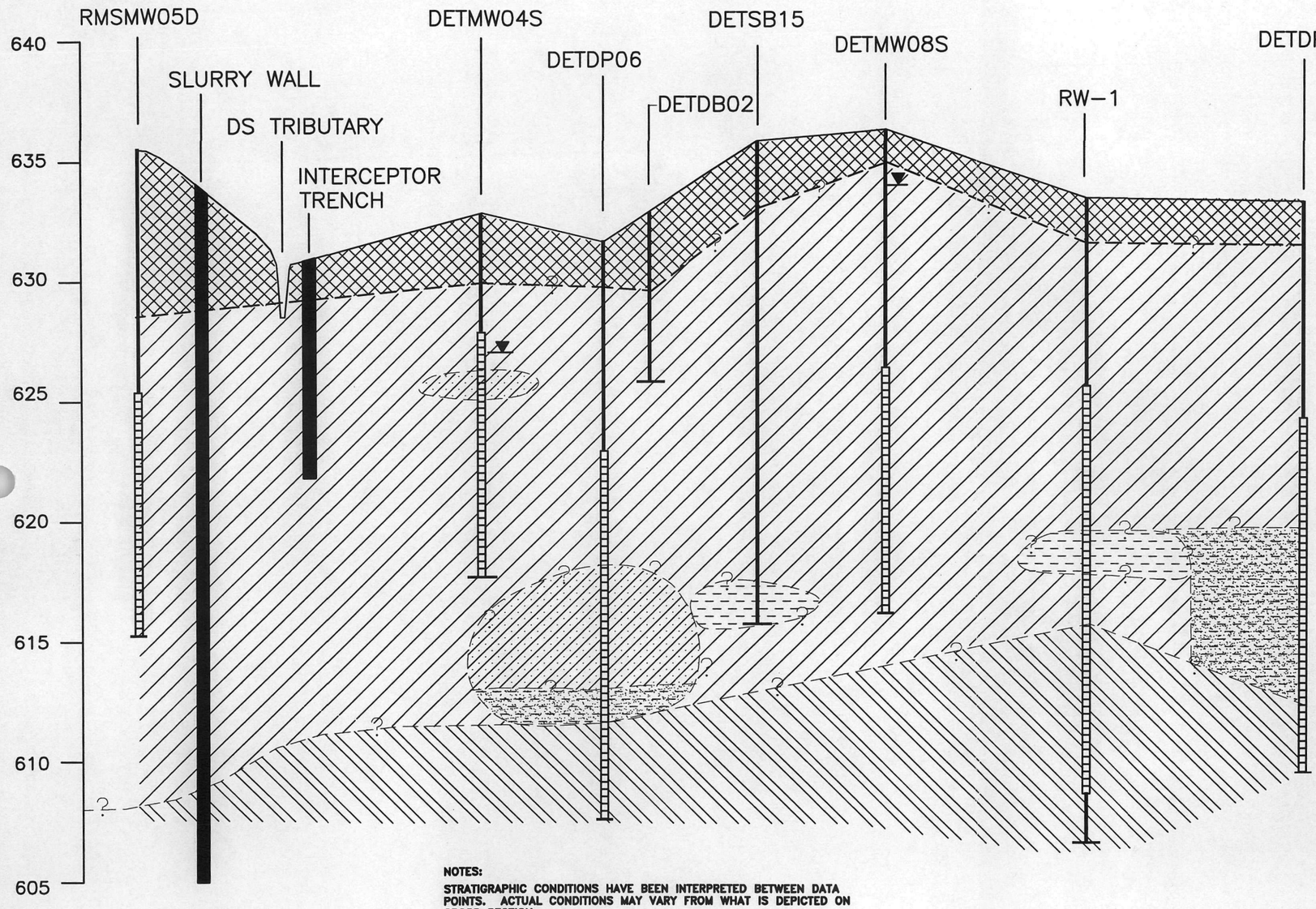
A

NORTHWEST

A'

SOUTHEAST



LEGEND

- CLAY WITH GRAVEL, SAND (FILL)
- SILTY SAND (LACUSTRINE)
- SILTY CLAY (LACUSTRINE)
- SILT (LACUSTRINE)
- BROWN AND GRAY CLAY WITH SILT, SAND, AND GRAVEL (LACUSTRINE)
- GRAY CLAY (TILL) (ASHTABULA CLAY)

- SOIL BORING/MONITORING WELL LOCATION
- GROUNDWATER ELEVATION MEASURED ON 2/21/97
- WELL SCREEN

NOTES:

STRATIGRAPHIC CONDITIONS HAVE BEEN INTERPRETED BETWEEN DATA POINTS. ACTUAL CONDITIONS MAY VARY FROM WHAT IS DEPICTED ON CROSS SECTION.

ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.

GROUND SURFACE ELEVATIONS HAVE BEEN APPROXIMATED BETWEEN DATA POINTS.

SEE FIGURE 1-3 TOP OF TILL CONTOUR MAP FOR CROSS SECTION LOCATIONS.

VERTICAL EXAGGERATION = 30X

0 150
SCALE 1" = 150'

DETREX CORPORATION
Ashtabula, Ohio

Figure 1-4
Northwest-Southeast
Geologic Cross Section

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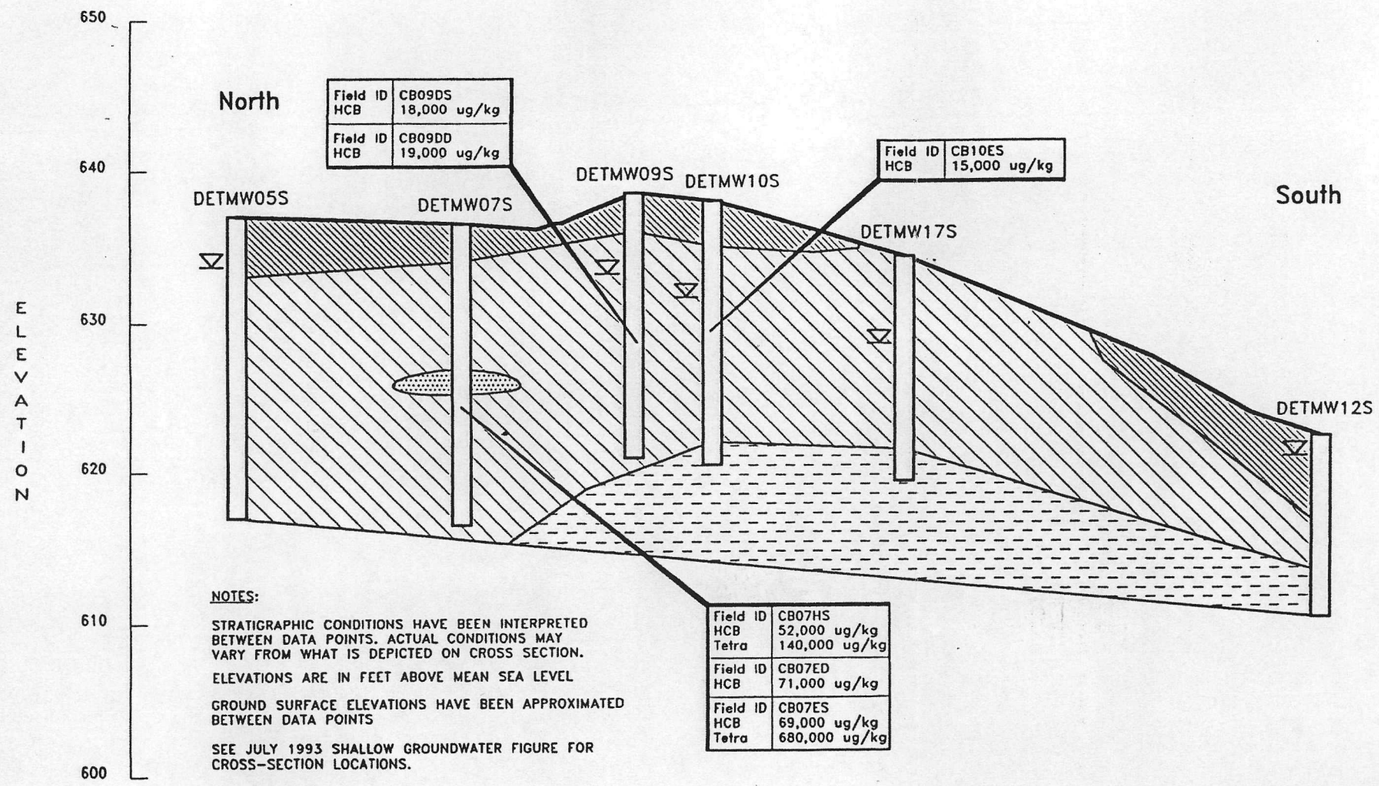
SECTION B–B'



NOTES:

STRATIGRAPHIC CONDITIONS HAVE BEEN INTERPRETED BETWEEN DATA POINTS. ACTUAL CONDITIONS MAY VARY FROM WHAT IS DEPICTED ON CROSS SECTION.

ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL

GROUND SURFACE ELEVATIONS HAVE BEEN APPROXIMATED BETWEEN DATA POINTS

SEE JULY 1993 SHALLOW GROUNDWATER FIGURE FOR CROSS–SECTION LOCATIONS.

LEGEND:

HCB = HEXACHLOROBENZENE

TETRA = 1,1,2,2–TETRACHLOROETHANE

▽ SAMPLE: WATER LEVEL

BROWN CLAYEY GRAVEL

BROWN SILTY SAND

GRAY SILTY CLAY

BROWN SANDY CLAY, TRACE GRAVEL

NOTES:

STRATIGRAPHIC CONDITIONS HAVE BEEN INTERPRETED BETWEEN DATA POINTS. ACTUAL CONDITIONS MAY VARY FROM WHAT IS DEPICTED ON CROSS SECTION.

ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.

GROUND SURFACE ELEVATIONS HAVE BEEN APPROXIMATED BETWEEN DATA POINTS.

SEE FIGURE 1–3 TOP OF TILL CONTOUR MAP FOR CROSS SECTION LOCATIONS.

VERTICAL EXAGGERATION = 20X

REFERENCE:

NORTH–SOUTH CROSS SECTION MAP TAKEN FROM FIGURE 4.3.7, COMPOUNDS DETECTED ABOVE CLEAN UP GOAL VALUES AND SUBSURFACE STRATIGRAPHY IN SECTION B–B' OF THE FIELDS BROOK PHASE I SCRI FOR DETREX CORPORATION, DATED 8–17–94.

0 200
SCALE 1" = 200'

DETREX CORPORATION
Ashtabula, Ohio

Figure 1-5
North-South
Geologic Cross Section

URS

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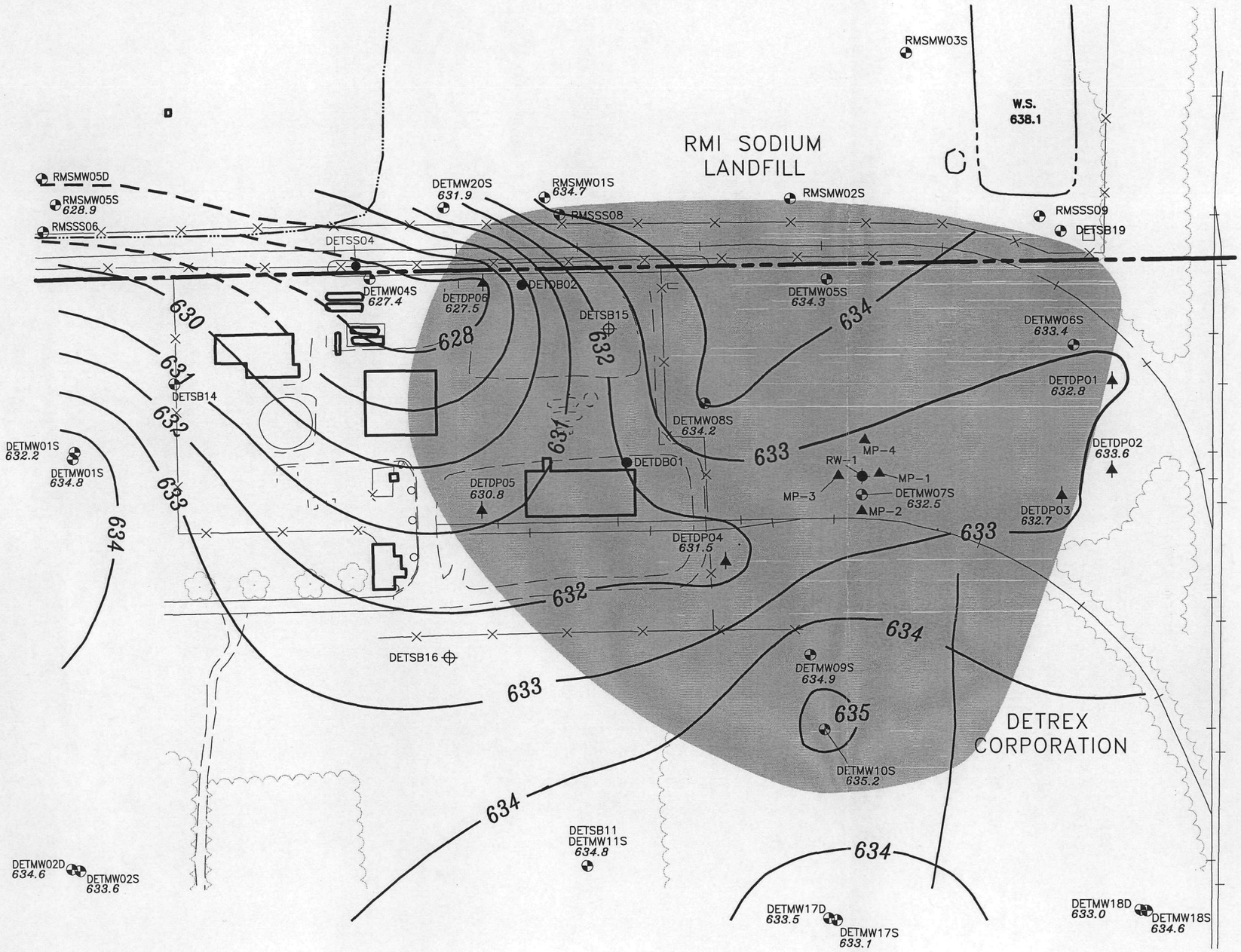

LEGEND

- DELINEATION PIEZOMETER LOCATION
- DELINEATION BORING LOCATION
- RECOVERY WELL LOCATION
- MONITORING PROBE LOCATION
- EXISTING PHASE I MONITORING WELL
- EXTENT OF DNAPL
- 633.4 TOP OF GROUND WATER ELEVATION
- —632— GROUND WATER CONTOUR LINE (CONTOUR INTERVAL = 1 FOOT)

DETREX CORPORATION
Ashtabula, Ohio

Figure 2-1
Groundwater Contour Map
February 21, 1997

URS

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Appendix A

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

CC: T. Dell
J. Venice
K. Mast-faxed
K. Buell-faxed
D. Church
R. Currie - faxed

REPLY TO THE ATTENTION OF:

March 22, 2005

Via Certified Mail
Return Receipt Requested

SR-6J

Mr. Thomas Steib
Detrex Corporation
1100 N. State Road
Ashtabula, OH 44004

RE: U.S. EPA Technical Support Issues Concerning the Addition of Experimental Extraction Wells and Site O&M- Detrex Source Control Area - Fields Brook Superfund Site - Ashtabula, Ohio - Docket No. - V-W-98-C-450

Dear Mr. Steib:

U.S. EPA Region 5 staff and specialists from U.S. EPA's Ground Water Technical Support Center (GWTSC) in Ada, Oklahoma have reviewed Detrex's 11/12/04 responses to past comments, the 12/12/04 Update to the Operations and Maintenance Manual and the 12/28/04 Supplemental Pilot Study for the DNAPL Recovery System. Comments from the GWTSC are provided as an attachment to this letter. Comments for U.S. EPA Region 5 are, as follows:

Supplemental Pilot Study for the DNAPL Recovery System

The GWTSC recommends that one of the two test wells be placed in an area of moderate silting, so that a broader evaluation of the test wells can be conducted. Within 30 days of receipt of this letter, Detex should provide to U.S. EPA an updated map showing the proposed placement of the wells and an implementation plan for well installation. The implementation plan should be a brief document that includes a schedule, information regarding the contractor(s) and key personnel, and an updated Health and Safety Plan for the test well installation work.

Update to the Operations and Maintenance Manual

O&M monitoring at the Detrex Operable Unit should serve to demonstrate that the site groundwater and DNAPL are not potential sources of contamination to Fields Brook or its tributaries. Detrex needs to provide comprehensive analytical, water level and product thickness data showing the effectiveness of the slurry wall, the collection trenches and the DNAPL removal system. It is unclear how the proposed monitoring plan will pull together the information to show that the system is working to protect Fields Brook over the long- term through the

containment and removal of DNAPL and contaminated groundwater. The O&M Plan should be revised and resubmitted for U.S. EPA review within 30 days of Detrex's receipt of this letter.

Health and Safety

In addition to the preparation of a Health and Safety Plan for the installation of the test wells, Detrex must submit a revised Health and Safety Plan for O&M. This Health and Safety Plan must include a proper air monitoring and respiratory protection program for workers (especially for those who enter the pump houses where vapors accumulate). U.S. EPA may conduct another inspection of the site to verify that appropriate equipment is available, is in working order and is properly calibrated. All HASPs (and critical site documents) must be readily available at the site and personnel must be fully trained per OSHA requirements (with documentation of training on file for review). Because Detrex should already have an updated Health and Safety Plan for O&M on file, Detrex should submit a copy of the most recent HASP to U.S. EPA no later than 10 days after receipt of this letter.

Request to Modify Hours of Operation for the DNAPL Extraction System

In response to a downturn in business, Detrex has requested that U.S. EPA approve a reduction in the hours of operation for the DNAPL Extraction System. At this point in time U.S. EPA is denying the request to reduce the hours of operation. Without a clearly planned monitoring and implementation program, U.S. EPA does not have a good understanding of what progress is being made in the removal of DNAPL and what would be sacrificed by the reduced extraction time. Therefore, at this point in time, U.S. EPA does not think it appropriate to reduce extraction hours. In terms of the financial burden of operation, Detrex is responsible to implement the work identified under the Unilateral Administrative Order and has failed to demonstrate that fluctuations in business at the local facility warrant reduced work at the site when the corporation has the financial capability of performing the work.

If you have any questions concerning U.S. EPA comments and requirements, please do not hesitate to contact me at 312-353-6564.

Sincerely,

Terese A. Van Donsel
Remedial Project Manager

Attachment

cc: T. Short / EPA-R5
P. Felitti /EPA-R5

C. Maurice/EPA-R5
D. Burden / EPA-GWTSC
R. Williams / OEPA
R. Currie / Detrex
Site File - Fields Brook / Detrex

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL RISK MANAGEMENT RESEARCH LABORATORY
GROUND WATER AND ECOSYSTEMS RESTORATION DIVISION
P.O. Box 1198 Ada, OK 74820

OFFICE OF
RESEARCH AND DEVELOPMENT

March 2, 2004

MEMORANDUM

SUBJECT: Review of the Fields Brook Supplemental Pilot Study DNAPL Recovery System Work Plan, and the Revisions to the Operations and Maintenance Manual (04-R05-001)

FROM: David S. Burden, Ph.D., Director /s/
U.S. EPA Ground Water Technical Support Center

TO: Terese Van Donsel, RPM
U.S. EPA Region 5

The following are review comments of the documents associated with the Field Brooks Superfund Site - Detrex Corporation Operable Unit, located in Ashtabula, OH. This review was performed in response to a request from EPA Region 5 to EPA's Ground Water Technical Support Center (GWTSC), located in Ada, OK. Specifically, the Region requested a review of the *Supplemental Pilot Study DNAPL Recovery System Work Plan* (the "Work Plan") and the revisions to the Operations and Maintenance Manual (the "Revisions"). The review was conducted under my oversight, by EPA's contractor to the GWTSC. Specifically, the site documents were reviewed by, Dr. Dan Pope of the Dynamac Corporation. I have carefully reviewed these comments and concur with them. If you have any questions or comments please contact me and I would be happy to arrange a conference call with myself and Dr. Pope.

DNAPL recovery operations at the Fields Brook site (the "Site") have been hampered by poor performance of the recovery system, including DNAPL pumping difficulties associated with silt and crystalline materials in the DNAPL.

General Comments

The reviewed documents present:

1) an evaluation of several pump types; the pumps are proposed to help solve the DNAPL recovery problems associated with silt, contaminant crystals, and short-circuiting of air in the recovery wells,

2) proposals for two new DNAPL recovery wells to be installed for testing the new DNAPL extraction pumps,

3) proposals for a monitoring network and sampling regime to monitor a downgradient vertical barrier wall, a ground-water collection trench upgradient of the barrier wall, and a ground-water collection trench beneath the DS tributary

4) proposals for a monitoring network and sampling regime to monitor the DNAPL plume.

Proposed DNAPL Recovery Pump Types

The "positive displacement piston pumps" proposed for DNAPL extraction, appear to be promising for helping to solve the DNAPL recovery problems, based on the description of pump characteristics. It seems appropriate to move to a field test of the new extraction pump and well system.

Proposed DNAPL Recovery Wells

The Work Plan indicates "In order to evaluate the effectiveness of the proposed extraction well design, the two wells will be installed in the general vicinity of existing wells where the greatest amount of silting has been observed." It might be better to locate one of the proposed wells where a moderate amount of silting has been observed, to get a more general view of the effectiveness of the new approach.

Proposed Monitoring Network and Sampling Regime – Barrier Wall/Trenches

There are several problems with the proposed monitoring system. It is not clear why the proposed "upgradient" wells (for monitoring the barrier wall and collection trenches) were chosen. It is not immediately obvious how the chosen well locations are related (from a monitoring standpoint) to the locations of the barrier wall or the collection trenches. A full explanation should be provided for why these locations were chosen. The explanation should include discussions of the ground water flow patterns and contaminant transport, with emphasis on the area of the site near the barrier and trenches. These discussions should be oriented to providing a reasoned explanation of the monitoring scheme (i.e., the three-dimensional location of the monitoring wells relative to the barrier/trenches). Although the chosen downgradient monitoring wells seem to be more obviously related to the barrier/trenches locations, it would be appropriate to provide a similar explanation for these wells also.

Figures and diagrams should be included to clarify the discussions; e.g., ground water elevation contour maps, geological cross-section maps showing the geological structure, barrier/trench locations, and well screen locations.

In addition, a full discussion of the goals of the monitoring program should be provided; e.g., what the monitoring program is supposed to achieve, and how the monitoring data will be used to make site-related decisions. The documents reviewed indicated only that "After five years of sampling, a review will be made of the results and the sampling program may be modified if results appear to be stable." It is unclear what "results" are intended, what "stability" means, what sampling program modifications may be under consideration, or how the decision to modify the sampling program will be made. For example:

1) "results" should be defined in terms of specific parameters to be measured and evaluated (contaminant dissolved concentrations, NAPL levels/sheens, ground-water elevations/flow patterns, etc.),

2) "stability" should be defined in terms of the measured parameters, with appropriate statistical tests to assess stability (e.g., no change, or perhaps a consistent declining trend in contaminant concentrations, based on the Mann-Kendall trends test), and

3) "modifications" should be defined in terms of a list and decision tree of alternative decisions/actions to be made/taken based on the evaluated results of monitoring (e.g., if a trends test shows that the contaminant concentrations in the wells are increasing, new monitoring wells and extraction wells will be installed to monitor plume expansion, and enhance source removal).

Proposed Monitoring Network and Sampling Regime – DNAPL Plume

The purpose of the DNAPL plume monitoring is not clear. The documents reviewed indicate "Select wells will be monitored to evaluate the southern and western edges of the DNAPL plume." Only three wells are to be monitored, and they appear to be far away from the DNAPL plume, according to Figure 5 of the Revisions. One of the specified wells (DETMW02S) appears to be 400+ feet away from the indicated extent of the DNAPL plume. There is no discussion of what the "evaluation" will involve. If DNAPL plume expansion is to be monitored, it seems more appropriate to place several monitoring wells closer to the plume boundaries. In addition, there is no discussion of why only the southern and western plume edges are to be monitored. Concerning decisions to be made based on the monitoring, the documents reviewed indicated only that "After five years of sampling, a review will be made of the results and the sampling program may be modified if results appear to be stable."

The recommendations for the proposed Monitoring Network and Sampling Regime – DNAPL Plume are similar to the recommendations for the proposed Monitoring Network and Sampling Regime – Barrier Wall/Trenches. A full explanation should be provided for why the monitoring well locations were chosen, including discussions of DNAPL transport and the ground water flow patterns. Figures and diagrams should be included to clarify the discussions; e.g., ground water elevation contour maps, geological cross-section maps showing the geological structure, DNAPL plume configuration and behavior, and well screen locations.

A full discussion of the goals of the monitoring program should be provided; e.g., what the monitoring program is supposed to achieve, and how the monitoring data will be used to make site-related decisions. Terms (results, stability, modifications, etc.) should be defined. The possible range of alternative decisions based on the monitoring data should be listed and discussed, and a decision tree showing how the decisions will be made based on the data should be provided.

Specific Comments

Page 2-1 Revisions

2.1 System Description

"System modifications are currently being evaluated due to continuing problems of excess silt, collapsing wells, and short circuiting of compressed air in wells."

Apparently, there is still some confusion over the "collapsing wells" problem. Previous Site documents had indicated there were no collapsing wells.

cc: Rich Steimle, (5102G)
Larry Zaragoza, (5204G)
Luanne Vanderpool, EPA Region 5 (SR-6J)
David Wilson, EPA Region 5 (SR-6J)
Charles Maurice, EPA Region 5 (SR-4J)